FRIEDRICH

Installation and Operation Instructions

This manual covers the following models:
- **WRT1 PTAC Wireless Remote Thermostat**
- **Base Module**

Description	
Gas or Oil Heat	Yes
Electric Furnace	Yes
Heat Pump (No Aux. or Emergency Heat)	Yes
Heat Pump (with Electric Aux.)	Yes
Heat Pump (with Gas Aux.)	No
Multi-stage Systems	No
Heat Only Systems	Yes
Heat Only Systems - Floor or Wall Furnaces	Yes
Cool Only Systems	Yes
High and Low Fan Speed	Yes
Millivolt	No
Emergency Heat	No
Conventional Single Stage Furnace	Yes
Geothermal	Yes

Power Type

Battery Power
Hardwire (Common Wire)
Hardwire (Common Wire) with Battery Backup

A trained, experienced technician must install this product.

Carefully read these instructions. You could damage this product or cause a hazardous condition if you fail to follow these instructions.

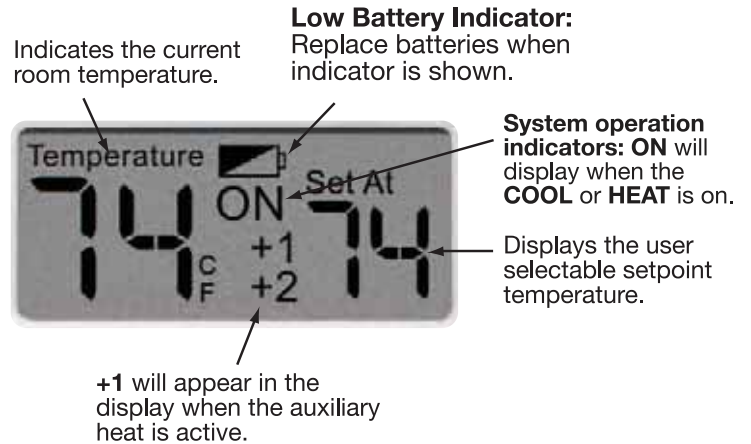## Table of Contents

Need Help?

For assistance with this product, please call Friedrich Technical Assistance Center at 877-599-5665 ext. 261 between the hours of 8:00 AM - 5:00 PM CST.

Getting to know your thermostat

① **LCD**

Indicates the current room temperature.

Low Battery Indicator: Replace batteries when indicator is shown.

System operation indicators: ON will display when the **COOL** or **HEAT** is on.

Displays the user selectable setpoint temperature.

+1 will appear in the display when the auxiliary heat is active.

② **Fan Switch**

③ **System Switch**

④ **Setpoint Buttons**

Important:

The low battery indicator is displayed when the AA battery power is low. If the user fails to replace the battery within 21 days, the thermostat display will only show the low battery indicator as a final warning before the thermostat becomes inoperable.

Easy to use controls

Caution:
When the battery icon appears replace your AA batteries immediately. Failure to do so may result in your heating & cooling system becoming inoperable.

(1) **LCD Display:**
See page 2 for details about this display read out.

(2) **Fan Switch:**
AUTO will cycle the fan on only when the heating or cooling system is on. Select **LOW** or **HIGH** for the fan to run continuously at the selected speed.

(3) **System Switch:**
Selects the operation mode of your HVAC system. Selecting **HEAT** turns on the heat mode. Selecting **COOL** turns on the air conditioning mode. Selecting **OFF** turns both heating and cooling off.

(4) **Temperature Setpoint Buttons:**
Press the ⊞ + ⊞ or ⊟ – ⊟ buttons to select the desired room temperature.

A Note About Two-Speed Fan:

When the fan switch is set to **AUTO** and the system is in **HEAT** or **COOL**, the thermostat will switch from **LOW** fan to **HIGH** fan when the ambient temperature is 2x swing away from setpoint. The thermostat will switch back to **LOW** fan at 1x swing away from setpoint.

Wall locations

The thermostat should be installed approximately 4 to 5 feet above the floor.
Select an area with average temperature and good air circulation.

NO

NO

NO
(Behind Door)

YES
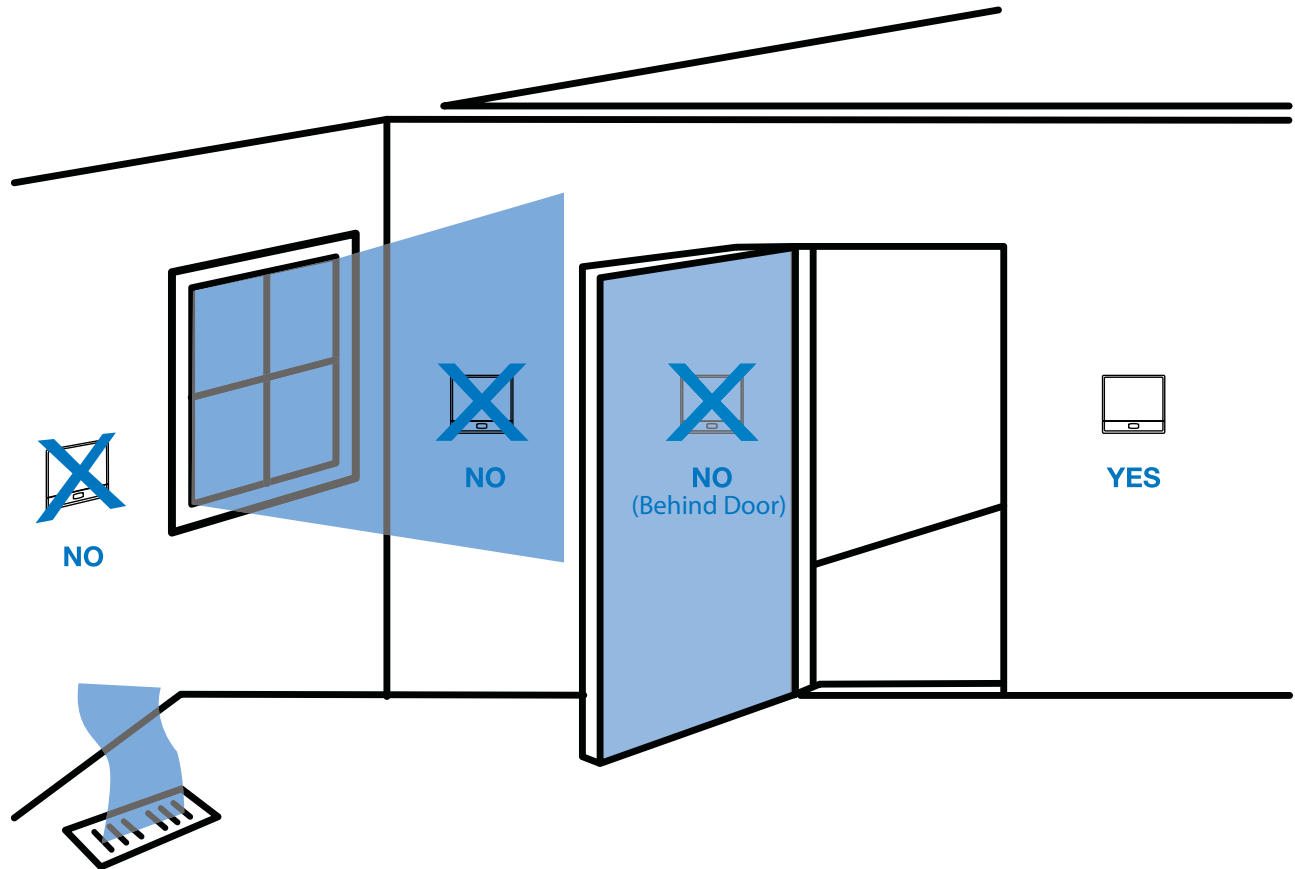
Do not install thermostat in locations:
• Close to hot or cold air ducts
• That are in direct sunlight
• With an outside wall behind the thermostat
• In areas that do not require conditioning
• Where there are dead spots or drafts (in corners or behind doors)
• Where there might be concealed chimneys or pipes

Friedrich Tip

Pick an installation location that is easy for the user to access. The temperature of the location
should be representative of the building.

Base Module - PTAC Installation

Wireless Range

Range between the WRT1 and the base module is up to 100 feet with no obstructions and up to 50 feet through standard building materials. To optimize the range try placing the base module higher if in a basement or further away from large metal objects.

The base module is designed to be mounted behind the front grille of your Friedrich packaged terminal air conditioner (PTAC). Refer to the Friedrich PTAC Installation & Operation Manual for instructions in removing the front grille. Check clearance to ensure the fit of front grille after base module installation. Ensure if mounting with screws that wires and lines are not damaged. See below for a few suggested options to mount the base module.

Note: For Friedrich Single Package Vertical Air Conditioners (Vert-I-Pak®) install module on the outside of the unit, in close proximity to the low-voltage terminal board.
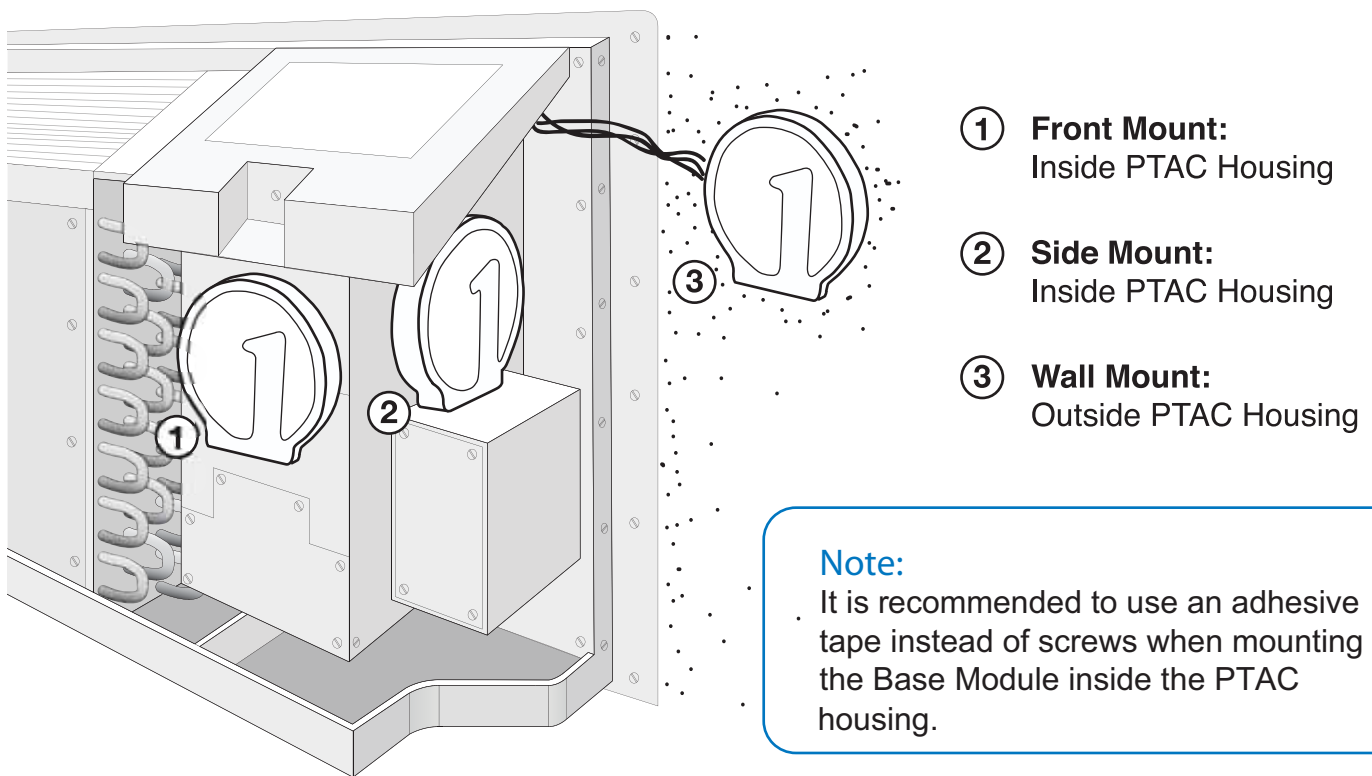
① **Front Mount:**
Inside PTAC Housing

② **Side Mount:**
Inside PTAC Housing

③ **Wall Mount:**
Outside PTAC Housing

Note:
It is recommended to use an adhesive tape instead of screws when mounting the Base Module inside the PTAC housing.

Friedrich Tip

Do not install the base module in locations:
• That are behind a chimney
• That require the signal to pass through significant metal or concrete blocks
• Where temperature could exceed 150ºF
• Where rain or snow or extreme hot or cold is possible

Caution:
Electrical Hazard
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

THERMOSTAT SUB-BASE INSTALLATION

**Caution:
Electrical Hazard**
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

Mercury Notice:
The WRT1 thermostat is mercury free. However, if the product you are replacing contains mercury, dispose of it properly. Your local waste management authority can give you instructions on recycling and proper disposal.

For vertical mount put one screw top and one screw bottom.

For horizontal mount put one screw left and one screw right.

Vertical mount

UP

Horizontal mount

Horizontal mount

Vertical mount

R
C
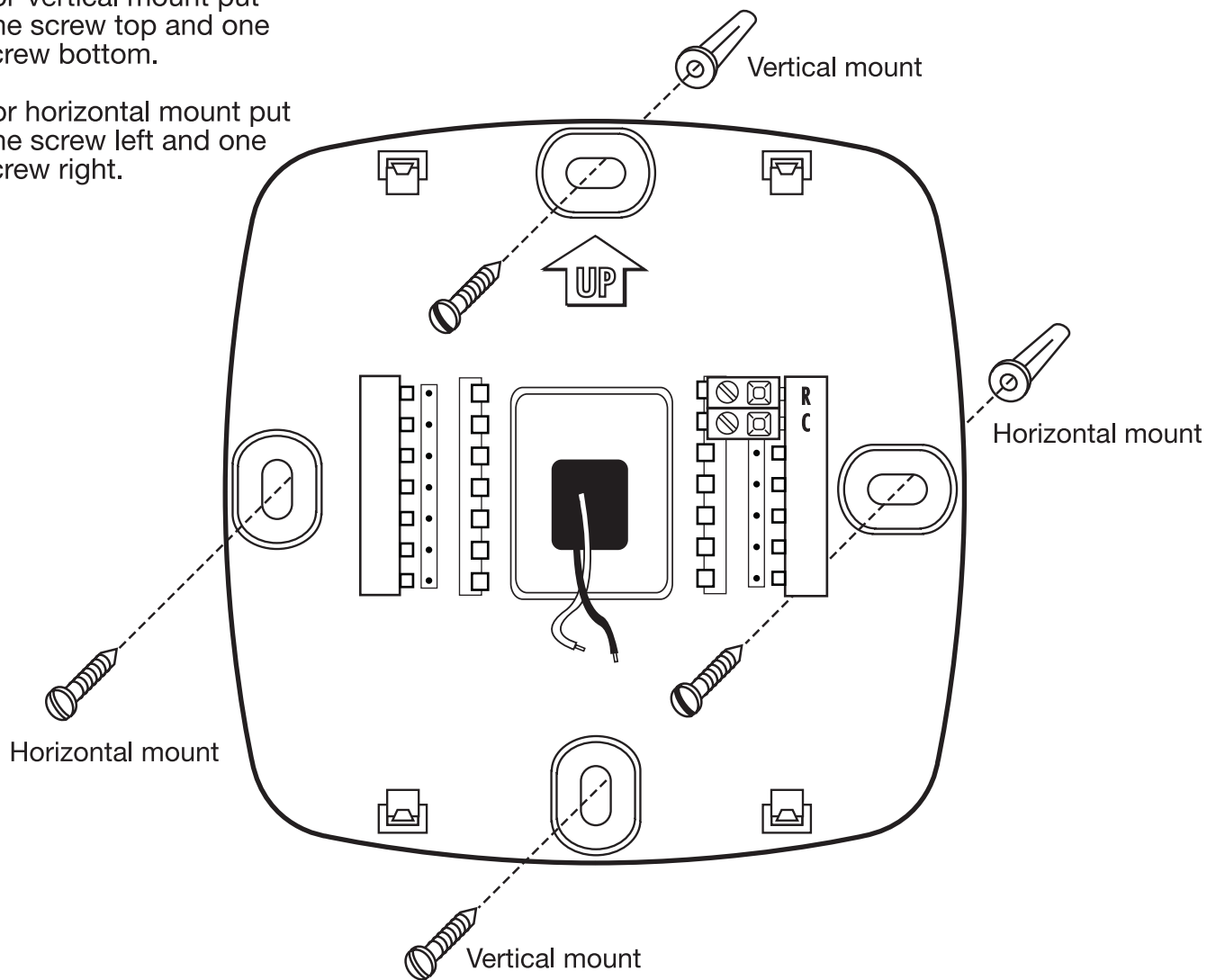
Friedrich Tip

The thermostat can be hardwired to a 24V power supply, however, it is not required. Batteries should be checked annually if 24V power is not connected.

Wiring Note:
Wire the base module's sub-base the same way you would wire a hardwired thermostat subbase.

Note:
To connect the base module to master thermostat, refer to the directions on page 11 of this manual.

For vertical mount put one screw top and one screw bottom.

For horizontal mount put one screw left and one screw right.

Vertical mount

UP

Horizontal mount

C
Y
O/B
GH

R
W
GL

Horizontal mount

Vertical mount
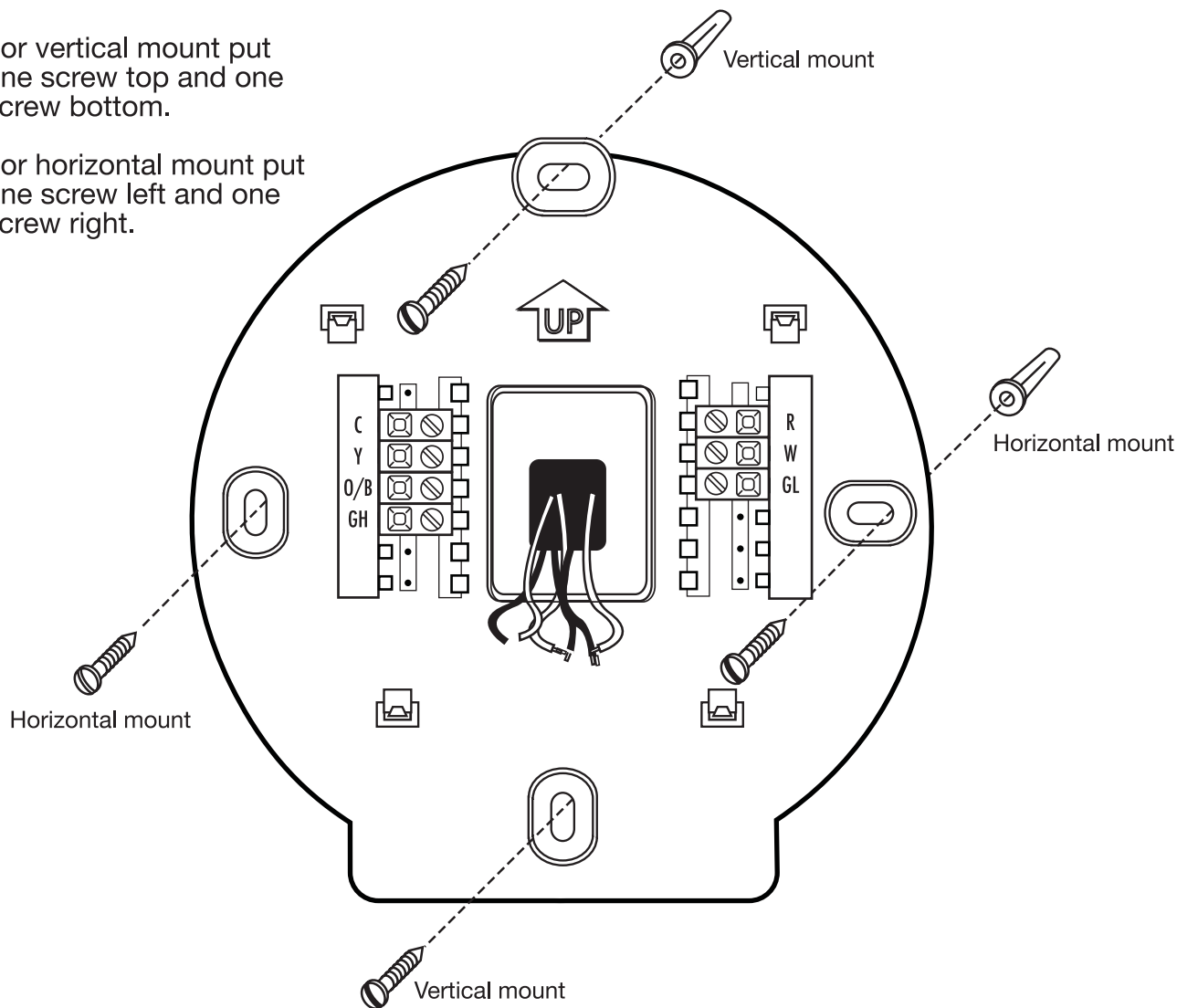
Note:
When mounting to a PTAC, ensure screws will not damage wires or coils.

The sub-base may be mounted using adhesive tape, such as double-sided tape or hook and loop strips when drilling is not practical.

Wiring

1. If you are replacing a thermostat, make note of the terminal connections on the thermostat that is being replaced. In some cases the wiring connections will not be color coded. For example, the green wire may not be connected to the **G** terminal.

2. Loosen the terminal block screws. Insert wires then retighten terminal block screws.

> ⚠️ **Warning:**
> All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

Wire specifications
Use shielded or non-shielded 18 - 22 gauge thermostat wire.

Terminal Designations on Base Module

This thermostat is shipped from the factory to operate a conventional heating and cooling system. This thermostat will also operate a heat pump system. See the "heat pump" configuration step on page 9 of this manual to configure the thermostat for heat pump applications.

Terminal	1 Heat 1 Cool Conventional System	1 Heat 1 Cool Heat Pump System
R	24 VAC Transformer power	24 VAC Transformer power
C	Transformer common	Transformer common
B	Energized in heating	Heat pump changeover valve energized in heating
O	Energized in cooling	Heat pump changeover valve energized in cooling
GL	Fan relay, Low	Fan relay, Low
GH	Fan relay, High	Fan relay, High
W	First stage of heat	Second stage of heat
Y	First stage of cool	First stage of heat & cool

## Terminal Designations on EM Master Thermostat

| Terminal	1 Heat 1 Cool Conventional System	1 Heat 1 Cool Heat Pump System
R	24 VAC Transformer power	24 VAC Transformer power
C	Transformer common	Transformer common

Connecting to a PTAC:

When connecting the Base Module to a PTAC, refer to the Friedrich PTAC or Vert-I-PAK® Installation and Operation Manual to enable remote thermostat operation.

1   Power supply

2   Jumper (not supplied) to connect GL and GH terminals

3   The thermostat must be set to O or B to match the changeover valve, O is cool changeover valve, B is heat changeover valve.

4   The Aux Heat Relay is energized as the second stage of heat.

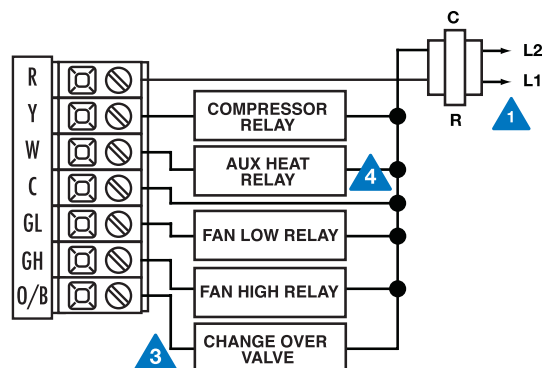### Friedrich PTAC 1H/1C system: 2 speed fan
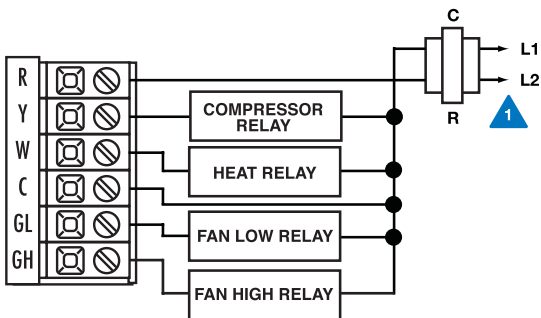
Friedrich PTAC 1H/1C system: 1 speed fan
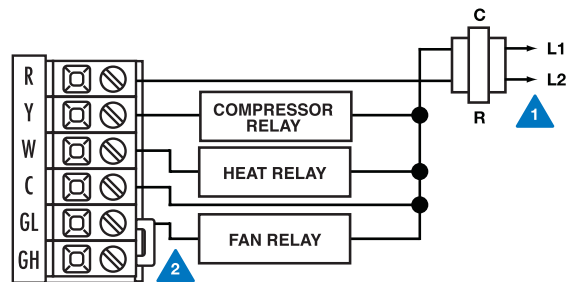
Note:
In Friedrich PTAC units with single speed fan operation, a jumper (not supplied) should be installed between GL and GH.

Friedrich PTAC and Vert-I-PAK
Heat Pump system: 2 speed fan

TECHNICIAN SETUP

Select **F** or **C**
with the jumper pin ① Reset button

② Select delay **ON** or **OFF**
with the jumper pin

③ Select **ELEC**
with this switch

Fahrenheit/Celsius Display ①

Select **F** or **C** with the jumper pin on the back of the thermostat.

> ⚠ **Important:**
> The **RESET** button must be pressed after changing any switch or jumper pin setting. Batteries must be installed for this operation.

Compressor Short Cycle Delay ②

The compressor short cycle delay protects the compressor from "short cycling". This feature will not allow the compressor to be turned on for 5 minutes after it was last turned off.

Using the jumper on the back of the thermostat, selecting **ON** will not allow the compressor to be turned on for 5 minutes after the last time the compressor was on. Selecting **OFF** will remove this delay.
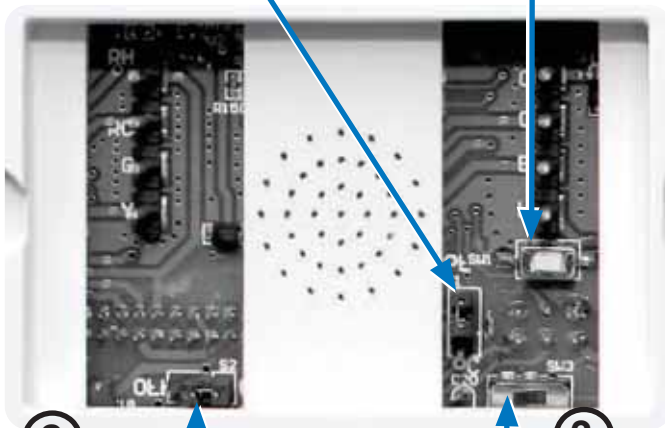
Electric Setup ③

Electric: The thermostat operation switch should be put in the **ELEC** position. This setting allows the thermostat to operate the fan when the fan relay is connected to the **G** terminal. Friedrich PTAC units will require ELEC fan relay.

Technician Setup Menu

This thermostat has 3 different setup configurations. To setup the thermostat for your particular application:

1. Set the thermostat system switch to **OFF**.

2. Press and hold ⏤ and ＋ together for 3 seconds. This 3 second delay is designed so that users do not accidentally access installer settings.

3. Configure the installer options as desired using the table below.

Use ⏤ and ＋ to change settings.

Tap ⏤ and ＋ together to move to the next step.

NOTE: When you want to exit Tech Setup options, move the system switch to **HEAT** or **COOL**.

Tech Setup Options	P for PTAC configuration			V for Vert-I-Pak configurations			
Room Temperature Calibration	**Change Over Valve Selection**	**Heat Pump**	**Heating Temperature Setpoint Limit**	**Cooling Temperature Setpoint Limit**	**Link Establish**	**Cooling Swing** (SYSTEM COOL)	**Heating Swing** (SYSTEM HEAT)
This feature allows the installer to change the calibration of the room temperature display. For example, if the thermostat reads 70° and you would like it to read 72° then select +2.	Select **O** for a changeover valve that energizes in cooling. Select **b** for a change over valve that energizes in heating.	When turned on the thermostat will operate a heat pump. Y will be first stage of heat & cool, W will be second stage heat.	This feature allows you to set a maximum heat setpoint value. The setpoint temperature cannot be raised above this value.	This feature allows you to set a minimum cool setpoint value. The setpoint temperature cannot be lowered below this value.	This step is used to connect **WRT1** to Base Module. Refer to page **12** for connection instructions.	The swing setting, often called "cycle rate", "differential" or "anticipation" is adjustable. A smaller swing setting will cause more frequent cycles and a larger swing setting will cause fewer cycles.	The swing setting, often called "cycle rate", "differential" or "anticipation" is adjustable. A smaller swing setting will cause more frequent cycles and a larger swing setting will cause fewer cycles.
LCD Will Show							
`CA  o`	`CO  o`	`HU oF`	`HE 90`	`CL 45`	`LE`	`08`	`08`
Adjustment Options							
You can adjust the room temperature display to read -4°F to +4°F above or below the factory calibrated reading.	**O** for cooling changeover valve [P] **b** for heating changeover valve [V]	**ON** configures the thermostat for heat pump systems.* [P] **OFF** configures the thermostat for non heat pump systems. [V]	45.0 ºF - 90.0 ºF	45.0 ºF - 90.0 ºF	NA	The cooling swing setting is adjustable from ±0.2°F to ±2°F. For Example: A swing setting of 0.5°F will turn the cooling on at approximately 0.5°F above the setpoint and turn the cooling off at approximately 0.5°F below the setpoint.	The heating swing setting is adjustable from ±0.2°F to ±2°F. For Example: A swing setting of 0.5°F will turn the heating on at approximately 0.5°F below the setpoint and turn the heating off at approximately 0.5°F above the setpoint.**
Factory Default Settings							
0 ºF	0	OFF	90 ºF	45.0 ºF	NA	0.8 ºF	0.8 ºF

***Select OFF on HU configuration for Friedrich models with the following suffix: A, B, C, D or E**

**** The second stage will turn on at 2x the swing setting. The second stage will turn off when 1x the swing is reached. For example, if the swing setting is 0.8º for heating and the thermostat is set at 70ºF, the first stage will turn on at approximately 69.2ºF. The second stage will turn on at 68.4ºF. The second stage will turn off at 69.2ºF and the first will turn off at 70.8ºF.

Establishing Communication between WRT1 and the Base Module

Easy, Two Step Communication Link

To set up the initial link between the Thermostat and the base module please follow the steps below:

Blue LED

Step 1.
LED Relay Indicators

1. Press and hold the **base module** button for 3 seconds. The **Blue LED** will flash when ready to receive initial signal from **WRT1.** (Base module must be powered by 24V. **Blue LED** will be continuously on when 24V power is present.)

2. Set the thermostat system switch to OFF. Press and hold ⌐−⌐ and ⌐+⌐ for 3 seconds. Tap ⌐−⌐ and ⌐+⌐ together until LE is displayed. Press and hold ⌐+⌐ until LE flashes 3 times, the Blue LED on the base module will stop flashing after communication has been established between base module and **WRT1.**

Base Module Button

Note:
The **Blue LED** on the **base module** will be on when power is present. The **Blue LED** will flash 3 times every time it receives a signal from **WRT1.** When a relay is on the corresponding LED relay indicator will be on.

Step 2.

Note:
If the base module does not receive a signal from the **WRT1** for 15 minutes it will turn off all relays until communication is reestablished. The **Blue LED** on the base module will also turn off to show communication has been lost.

MOUNT THERMOSTAT & BATTERY INSTALLATION
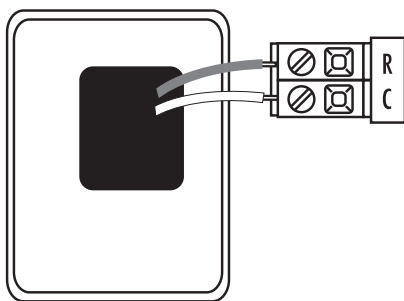
Mount Thermostat

Align the 4 tabs on the subbase with corresponding slots on the back of the thermostat, then push gently until the thermostat snaps in place.

Battery Installation

Battery installation is optional if thermostat is hardwired.
• R & C terminal connected to 24 VAC, Class II power

Insert 2 AA Alkaline batteries (included).

SPECIFICATIONS & CONTACT INFORMATION

Specifications

WRT1 Thermostat

The display range of temperature	41ºF to 95ºF (5ºC to 35ºC)
The control range of temperature	44ºF to 90ºF (7ºC to 32ºC)
Load rating	1 amp per terminal, 1.5 amp maximum all terminals combined
Display accuracy	± 1ºF (± 17.2°C)
Swing (cycle rate or differential)	Heating is adjustable from 0.2ºF to 2.0ºF (-17.67°C to -16.67°C)
	Cooling is adjustable from 0.2ºF to 2.0ºF (-17.67°C to -16.67°C)
Power source	18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire (common wire)
	Battery power from 2 AA Alkaline batteries
Operating ambient	32ºF to +105ºF (0º to +41ºC)
Operating humidity	90% non-condensing maximum
Dimensions of thermostat	4.7"W x 4.4"H x 1.1"D
Radio transmission frequency	916 MHz

Base Module

Load rating	1 amp per terminal, 1.5 amp maximum all terminals combined
Power source	18 to 30 VAC, NEC Class II, 50/60 Hz
Operating ambient	32ºF to +150ºF (0º to +65ºC)
Operating humidity	90% non-condensing maximum

Contact Us

F R I E D R I C H

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